REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

All claims stand rejected under 35 USC 103(a) as allegedly being unpatentable over Nishino. This contention, however, is respectfully traversed, for reasons set forth herein.

In accordance with Graham v. John Deere, applicants first discuss the scope and contents of the prior art.

Nishino is an inherently different system than the present system. Nishino uses a gestural system in which gestures are interpreted to control the high-level parameters of preprogrammed quadric equations. In this approach, motions are interpreted to mean something other than the raw motion. In Nishino's system, three types of shapes can be created, as illustrated in their figure 4A, page 54. The computer makes a decision - if the motion is strictly up and down it makes a cylindroid. If the computer detects an arc in the motion, it decides to make an ellipsoid. One can think of this as a linguistic approach - there is a language of hand motion. If the hand is moved in a certain way, it is like speaking the word 'ellipsoid', after which an ellipsoid is produced. They have three such words for creating shapes and several other kinds of words to move things around and deform them. If a user makes

something which is not detected, that is, it is not part of the gestural vocabulary, then nothing happens. These gestures are much like the gestures of American Sign Language - there is no necessary correspondence between the shape of the gesture and the shape which is produced.

In the present system motion is not interpreted, but rather directly translated into shapes. The path of the hand motion becomes shape or, in the language of claim 1, "shape defined by hand movements...". In this type of system, the user does not choose amongst a set of pre-defined shapes (which I would call "describing" a shape), but rather "defines" a shape by telling the computer exactly which points it contains. In Nishino, users choose between a finite and limited number of shapes (in their paper the number is three. While the parameters of these shapes can be changed, they go little beyond the basic form - sphere, ellipsoid, and cuboid. The claimed system, in contrast, allows any shape to be defined.

The current specification describes two methods for creating meshes by sampling the hand's motion:

one in which a surface is grown by adding more points to it, and one in which strokes are formed that are, piece by piece added to the surface.

Another issue is the preprogrammed equations themselves. Nishino et al use superquadrics - a functional representation - to represent their geometry. A functional representation is an equation which is pre-programmed into the application. The user interface then MODIFIES coefficients of this equation. Dealing with meshes we can build shapes for which no functional representation (combination of equations based on simple algebraic functions such as power functions, sine and cosine, sqrt, etc.) exists. Nishino's shapes are preprogrammed and tweaked.

Turning specifically to the claims, therefore, and in view of the information given above, claim 1 defines a method which is extremely different than Nishino. Admittedly, both Nishino and claim 1 having in common that positions of a user's hand are tracked. However, claim 1 also requires "forming a three dimensional model surface by adding shapes defined by hand movements at each of a plurality of intervals". This is not done or suggested by Nishino. Nishino first of all uses an equation, whose parameters are altered at different times. Each time that a new hand gesture is added, the characteristics of the equation are changed. Therefore, Nishino does not, as claimed, have shapes defined by hand movements at each of a plurality of intervals.

Moreover, Nishino uses an entirely different system then the present system. Nishino watches hand movements to determine what shape is described by the sign language. Those hand movements do not "define" the shape as claimed. For all of these reasons, claim 1 should be allowable.

Claim 2 should be allowable for analogous reasons to those discussed above with respect to claim 1. In addition, however, claim 2 defines that the inside surface of the hand is used, by tracking a movement of a tangent to the hand, to define a tangent plane. This is further distinguished over Nishino. The rejection states that page 55,column 1, lines 37-39 teach this. However, this only teaches the coordinate values of finger joints and its implicit super quadric equation. It teaches nothing about tracking movement of a tangent of the hand, much less defining a tangent plane of the surface being created. Moreover, and as described above, the movement of the hand never defines the tangent plane of the surface being created, but rather defines a shape which is then used to create the equation.

Therefore, claim 2 should be allowable along with claims 3-4 which depend therefrom.

Claim 4 defines more details about the mesh. Nishino uses super quadric equations, and never teaches a mesh whatsoever.

Therefore, Nishino does not define these limitations. He never adds samples, but only changes the function of the super quadric equation. Therefore, claim 4 should be additionally allowable.

Claim 5 should be allowable for reasons discussed above, and in addition defines creating new parts to change the identified parts. Again, as described above, Nishino never teaches or suggests this feature - he only teaches recalculating the equation as a whole. Therefore, claim 1 should be allowable along with claims which depend therefrom.

Claim 6 defines that the technique uses a projected plane. This is rejected with reference to Nishino page 55, column 1, lines 5-10. This refers to the word projection, but does not use it in the mathematical sense. The kind of projection being referred to in Nishino is a projector of the type that displays images coming out of the PC, for example. A projected plane is entirely different, even though the same word is used for both.

Claim 7 should be allowable for reasons discussed above as well as the claims which depend therefrom.

Claim 8 depends from claim 1. Consider the following. We use the hand to directly define shapes. But we do not want the hand always doing so.... if the user were to scratch their nose, it would make a mark. Claim 8 defines a method of using a hand posture to start the sampling process, and another one to end

it. Nishino does not suggest a certain posture which tells the gesture recognizer that a gesture is beginning, and a certain posture that the gesture is ending. There is no similarity here. The cited portion merely describes that users can choose which gestures they want to map to certain operations.

This text does not refer to stopping and starting postures. Moreover this shows how there is no relation between the form of a hand motion in Nishino's system and the shape produced -- this text describes how users can choose any hand motion to produce a shape. In the claimed system the form of a hand motion is exactly mapped to a shape.

Claim 9 defines an eraser tool. Nishino does not erase parts of his shapes, and he cannot. It is not known (even today) how to remove regions from shapes defined by superquadric equations. With polygonal meshes, it is well known and quite easy. The eraser could not have been done in Nishino's system due to computational limitations.

Claim 10 defines props. The meaning is well-known in this art. See for example of Hinckley, K., Pausch, R, Goble, J., Kassell, N., Passive Real-World. Interface Props for Neurosurgical Visualization, ACM CHI'94 Conference on Human Factors in Computing Systems, 1994, pp. 452-458. (goto <http://research.microsoft.com/users/kenh/> to download it).

Props are physical objects that are customized to become actors in a computer environment. A prop is not a hand gesture.

At least, the claims 11-13 cannot be read on a hand motion.

Claim 15 defines the modeled surface is based on the position of the user's hands at different times. As described above, this is not taught or suggested by the cited prior art. In order to emphasize this, however, the language has been clarified to state that the hand position at the different times is used to form actual points on the surface. Therefore, claim 15 should be allowable, along with the claims which depend therefrom.

Claim 16 defines the use of 3D strokes. Nishino does not produce strokes. He only produces cuboids, ellipsoids, spheres, volumetric things that are not strokes. This is very different.

Claim 17 is even further patentable. Nishino does not teach using the end of the hand to define 3-D stroke curvature.

Similarly, claim 18 defines using 7 degrees of freedom for the purpose of shape creation. Nowhere is this taught or suggested by Nishino, as discussed above.

Claim 19 defines merging samples from one hand position into an existing shape. As described above, Nishino uses a quadric equation, which is not merged into the existing shape, but rather is recalculated.

Claim 20 should be allowable along for the reasons stated above.

Claims 21-25 define the enhancements of the stroke based way of considering this problem.

Claim 26 should be allowable for reasons discussed above, and specifically because it defines forming the modeled surface by adding shape defined by hand movements. As described above, Nishino could only recalculate the whole shape, not add shapes. Claim 27 should be allowable for similar reasons. Claim 27 defines incrementally getting surface regions, which is not done by Nishino; rather Nishino recalculates the entire shape. Moreover, Nishino teaches nothing about an extant surface.

Claim 29 defines taking a hand motion to define a new shape, using this new shape to deform. This is not taught or suggested by Nishino.

Finally, claim 31 defines using continuously varying variables. The difference between this and the cited prior art has been extensively discussed above. Nishino does not use hand variables to define a shape, but rather uses those variables to define a gesture which is interpreted to select from one of a series of pre-defined shapes. In view of the above amendments and remarks, therefore, all of the claims should be in condition

for allowance. A formal notice to that effect is respectfully solicited.

It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the above amendments and remarks, therefore, all of the claims should be in condition for allowance. A formal notice to that effect is respectfully solicited.

Applicant asks that all claims be allowed. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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